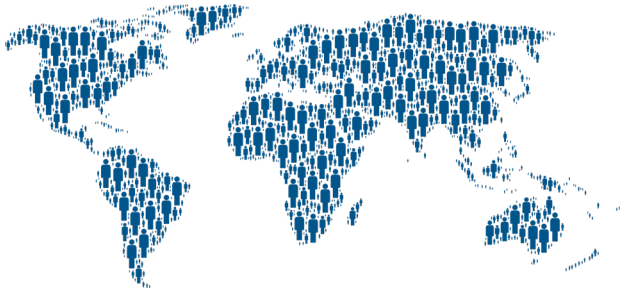
snapAG FOOD

GLOBAL PROTEIN CONSUMPTION

OUR GROWING WORLD POPULATION



The United Nations predicts that the planet will support more than 9.5 billion people by the year 2050.

The human population will exceed 10 billion by 2100.[1]

This will put pressure on the world's resources to produce more food, including protein foods which are an essential part of a healthy diet.

FOOD SELECTION: A COMPLEX WEB

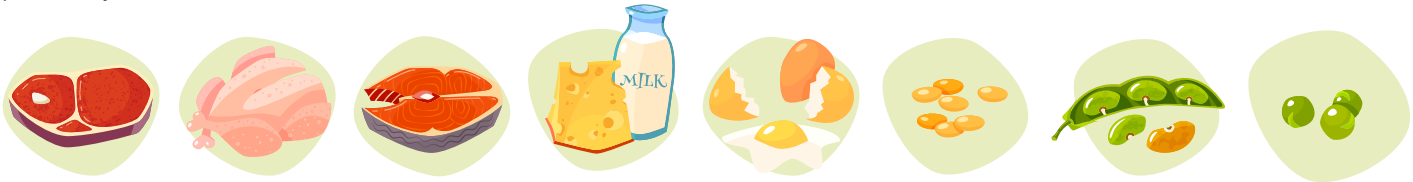
Around the world, protein choice is influenced by a wide variety of factors, including **societal and cultural forces** (e.g., customs, taboos), **economic influences** (e.g., income, cost, availability), as well as **ethical and health concerns.** Throughout history, food choices and availability have also been affected by social status, immigration, colonization, political stability or instability, as well as environmental factors.

Improvements in agricultural practices and productivity over the past 50 years have increased the world's capacity to provide more food, greater diversity of foods and year-round access.[2] This has resulted in considerable changes in food consumption, depending on income and geographical location.[3]

PROTEIN TODAY

In economically advantaged countries, such as Canada, meat has traditionally been an important part of most meals. In many developing countries, plant-based proteins are most common.[4]

The demand for both plant-based and animal based-protein is increasing on a global basis.[5] However, while developed countries are reducing their animal-based protein intake, largely as a result of animal welfare concerns, environmental questions and health uncertainties, higher incomes, falling food prices and urbanization in the developing world have increased demand for animal protein, particularly in Asian countries such as China.[6,7]



Beef | Chicken | Fish | Dairy | Eggs | Lentils | Soy Beans | Peas

CANADIAN TRENDS

There are advantages to consuming a mix of plant- and animal-based protein sources. Both have unique nutritional qualities required by Canadians to be healthy.

Many Canadians are opting to add more plant-based proteins to their diet, as reflected in the new *Canada's Food Guide*.[8] Vegetarianism (consumption of limited animal-based products) and veganism (no animal-sourced proteins in the diet) are also growing. It is estimated that there are over 3 million vegetarians and vegans in Canada.[9]

As Canadians have access to a wide range of protein sources we also have choices with regard to how proteins are grown or raised, largely because of consumer demand. Examples include organic plant-based or animal-based protein foods, grass-fed beef or beef animals raised without added hormones, free-range chicken, cage-free eggs, and so on.

A Note On Nutritional Quality

Animal-based proteins provide all **essential amino acids** (EAAs) we need in our diets. Plant-based protein foods typically do not. However combining a variety of plant-based proteins such as cereals (wheat, corn and rice) and pulses (lentils, beans and chickpeas) provide a balanced source of amino acids.

PLENTY OF PROTEIN OPTIONS!

Food security, or the ability for all people to have access to safe and nutritious food at all times, depends on sustainable sources of protein. To meet food needs for a growing population, scientists and the food industry are working to develop alternative sources of high-quality protein.

Insects – Approximately 2,000 species of insects[10] have been used as food to supplement the diets of approximately 2 billion people in parts of Asia, Africa and Latin America.[11]

Fish – In many places, fish and shellfish are the only readily available sources of protein that people can self-harvest throughout the year.[12] Aquaculture supplies 50% of all fish consumed globally today[13] and is a growing industry.

Algae – Marine plants such as seaweeds and microalgae represent a promising future protein source. Nutritionally they are comparable to vegetable proteins.[14]

Cultured meat – This involves allowing cells, most frequently stem cells, to "grow" outside the animal's body to create high-quality complete proteins. The media used to grow the cells often contain nutrients from animal sources. It is still in developmental stages.[15]

Reducing food waste is another important strategy in the global management of food. This includes overconsumption of food energy, which is common in most diets in developed countries. It is estimated that 30–50% of all food is wasted. In countries like Canada, the largest proportion of food waste occurs at the household level.[16]